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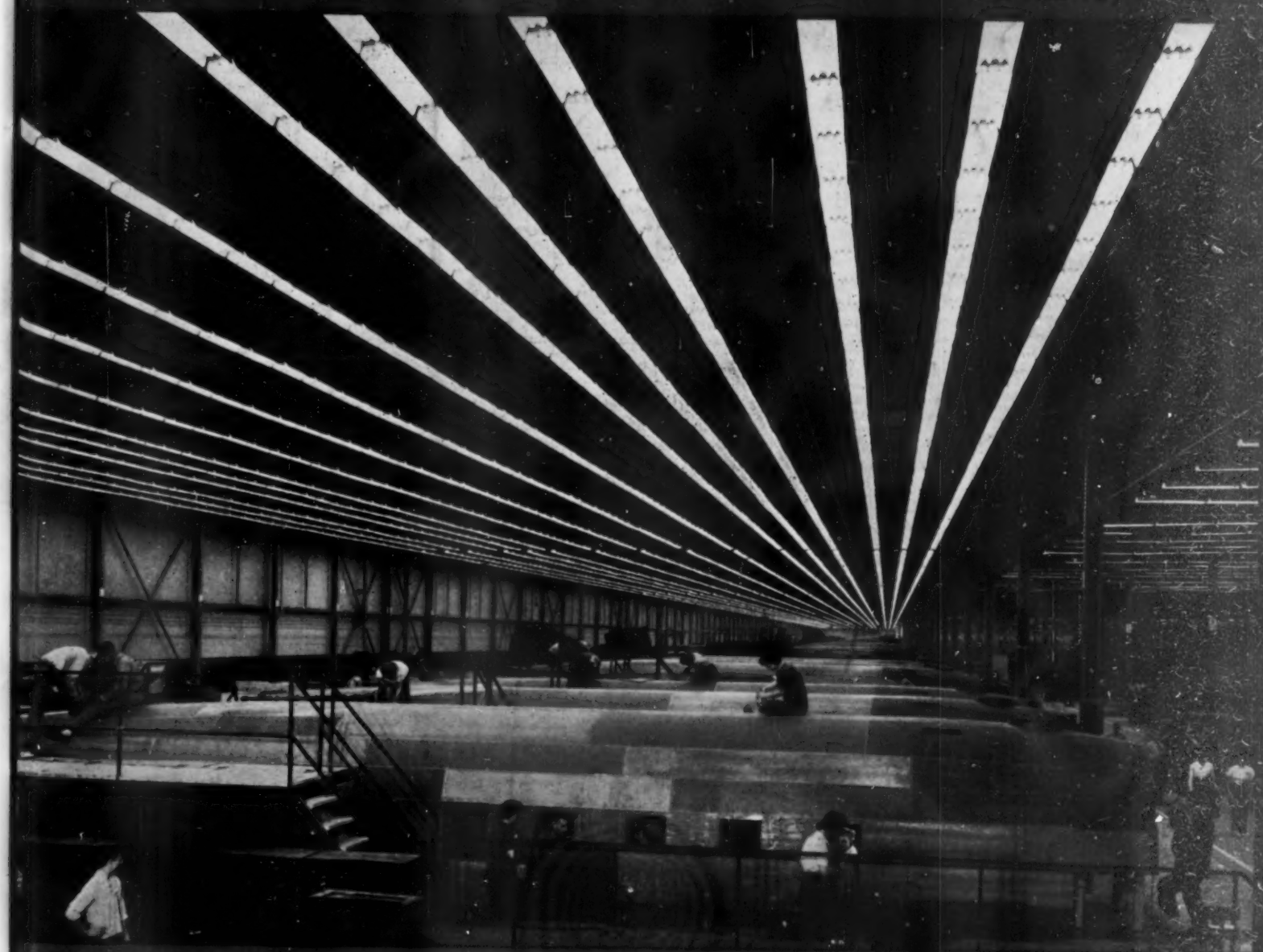
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE • APRIL 10, 1943



Light for Growing Wings

See Page 229

A SCIENCE SERVICE PUBLICATION

TEC W 1903

Do You Know?

Dehydrated liver meat is marketed as a powder.

Cork tires for airplane landing wheels are reported to be under trial in Portugal.

One of the well-known *bombers* has over 50,000 parts, not including nuts and bolts.

At least six hours of *sunlight* are necessary daily for growing ordinary vegetables successfully.

Glycerin is recovered in larger quantities and more economically in soap-making by a new alcohol process.

Pocket gophers are reported to be able to run backward for short distances about as rapidly as they can forward.

The average acre of American cotton produces about 200 pounds of *cottonseed* meal and 70 pounds of oil in addition to the lint.

The supply of professional *geographers* available to meet the needs of the Government, fighting a world-wide war, is far below the need.

Shark-liver oil with vitamin-A potency of 23,500 English units per gram is being produced in Cuba from a monthly catch of some 200 sharks.

Some 6,000 leading farmers in West Virginia, covering nearly every rural area, will demonstrate this year how *contour* strip-cropping can increase yields.

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Most articles which appear in SCIENCE NEWS LETTER are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.

An official survey shows that about 37,000,000 *turkeys* will be raised this year, an increase of 12% over 1942.

Peru is reported to be developing its supply of hog bristles, horse hair and cow hair to meet the needs of the United States.

The *electroplating* method of applying a coating of tin to another metal requires only one-half as much tin as needed in the hot-dip method, but gives a dull finish.

New Hampshire alone produced 65,000 gallons of *maple syrup* last year, equivalent to 520,000 pounds of sugar.

Farmers are urged by the U. S. Department of Agriculture to produce more milk, eggs, and meat; these are high *protein* foods.

The 1943 *hog production* in the United States should be some 20% greater than last year as the number of pigs to be farrowed this spring promises to be 24% larger than the 1942 crop.

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PSYCHIATRY

New Army School

Medical officers from civilian practice are taught how to handle mental ills developing in army and under strains of global war.

➤ MEDICAL OFFICERS entering the Army from civilian practice will have a chance to learn what sort of mental ills they may be called upon to treat in connection with modern warfare and military life. The opening of a new Army school of military neuropsychiatry is announced in the *Journal of the American Medical Association* (April 3) by Col. Roy D. Halloran and Lieut. Col. Malcolm J. Farrell, of the Army's Surgeon General's Office.

Special strains put upon the mind, nerves, and emotions of soldiers by service in the Air Corps, the Tank Destroyer, Ranger and other special service units will be discussed as part of the course in this new school. The medical officers will learn how to cut the time they take to observe and treat individual patients to the brief periods that military emergencies permit. They will learn how to unwind the red tape of necessary Army administrative procedures, so bewildering to the civilian physician.

The civilian physician specializing in mental illnesses is seldom faced with problems like those encountered in the Army. He may have been attached to a school or child guidance clinic, advising parents what to do with the problem child who won't eat his spinach or who habitually plays hooky from school or has gotten in with a tough gang and begun to steal and lie. Or he may have been in a state hospital, dealing only with patients who have long been ill with serious mental diseases. His patients may have been mostly women, prisoners, or other special groups.

In the Army he must treat young men, most of them in excellent health when they entered the Army, who have broken under the unusual physical and mental strain of mechanized, global war.

Nearly one third (30%) of the casualties now coming back from Africa, the Solomons, and the other war zones, it is estimated, are mental or nervous breakdowns, or have mental symptoms as part of the difficulty. This is revealed by an editorial in the same issue of the A.M.A. Journal. Nervous and mental disorders are major causes of medical discharge from the Army, it is stated.

Opening of the new school is shown by the editorial to be an outgrowth of the founding about a year ago of a special branch of the Surgeon General's Office devoted to neuropsychiatry. Col. Halloran is now chief of this branch and Lieut. Col. Farrell is assistant chief.

Under this division consultants on mental ills have been appointed to the various service commands in this country and to the European theater of operations and the Southwest Pacific theater. Mental hygiene programs have been planned to keep men in the replacement training centers in top-notch mental health. Liaison has been established with the Special Services Branch of the Army for promotion of morale. And the psychiatrists are giving their aid in handling Army problems of delinquency where these are shown to be tied up with medical problems.

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CHEMISTRY

Glycerin To Be Banned In Smokes and Toiletries

➤ GLYCERIN will be banned for use in foods, tobacco, cosmetics and toilet preparations starting in April. Medicinal use has been shoved down to 60% of normal recently with further reductions likely, due to demands of the explosives industry.

Scientists are now hard at work to develop substitute formulas. More than a hundred medicines in the National Formulary, an official book of drugs, are being studied by Dr. M. W. Green, E. C. Beeler and C. A. Steinmetz in the laboratories of the American Pharmaceutical Association.

Modified versions of 13 of the most widely used medicines have just been officially approved to permit pharmacists to make specified reductions in glycerin content ranging from 20% to 100%. Glycerin in some cases is entirely replaced by increased amounts of sugar.

From 20% to 50% of the glycerin can be omitted or replaced in many other medicines without affecting taste, appearance or stability, the scientists believe. Tests are now being conducted to find out how well the new products will stand up when kept in your medicine cabinet for a long time.

Corn syrup makes a successful substitute but will probably be too scarce to be practical.

"We're also studying the use of propylene glycol," Dr. Justin L. Powers, chairman of the National Formulary Committee, reports, "and indications are that it will be satisfactory."

Glycerin has long been used as a carrying agent for medicines because of its excellent solvent properties and because it does not ferment.

Small quantities are used to keep certain drug preparations moist and pliable. It is this same property that led to its use in cigarettes.

Just what the government ban will mean to the smoker is not yet clear but smokes are likely to be a good bit drier. Apple juice may be successfully used to keep the smokes moist, tests seem to show. The chemical diethylene glycol is already being used in some brands.

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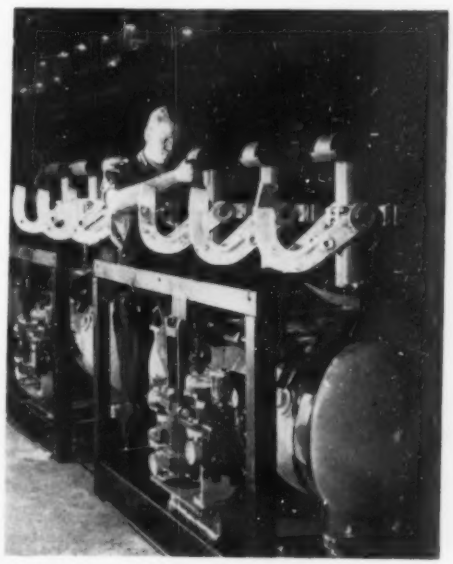

POWER PROTECTERS — Wind, blowing at 600 miles an hour from the compressed air chamber of these Westinghouse circuit breakers will blow out any short circuit arcs that threaten electric power equipment at a new Columbia Steel Company plant in Utah. The metal "fish hooks" are part of the breakers' contacts which automatically pull apart when a short circuit occurs. The arc jumping across the contacts is then instantaneously blown out by a blast of air just as little Johnny blows out the candles on his birthday cake.

NUTRITION

Vitamins on the Way

Two new important, soon to be isolated, factors in nutrition, were found in spinach and in cream. Function in human diet not yet established.

➤ SCIENTISTS in nutritional laboratories all over the country are pretty certainly going to present us with more vitamins in the future. You may think there are enough already to keep track of, but when you remember how much the vitamins mean for keeping people well, it is good news that still more may be on the verge of being discovered.

Discovery of a vitamin means that it has been isolated in pure form, Dr. Floyd S. Daft, of the U. S. Public Health Service's National Institute of Health, one of Uncle Sam's top-flight vitamin researchers, explains. As long as scientists are dealing only with an effect on animals of some substance in food, the vitamin has not been discovered, according to Dr. Daft's criterion, even though scientists may feel very certain of its existence.

Two new vitamins are on the verge of discovery, according to this criterion. One of them is folic acid. The University of Texas investigators who coined this name for it took the word folic from the Latin word for leaf, folium.

"Perhaps they were influenced by the fact that they had obtained their active concentrate from four tons of spinach," Dr. Daft suggests. "They also discovered that this vitamin is especially abundant in green leaves of many kinds."

This vitamin is still in the not-quite-discovered stage because so far scientists have been working with concentrates, not with the pure folic acid. Consequently some of the effects attributed to the vitamin may be due to some impurities, that is, other still undiscovered vitamins associated with folic acid.

Folic acid is said to increase the growth rate and restore the color of hair to rats; to influence the hatchability of eggs; to be essential for normal growth and for hemoglobin formation and normal feathering in young chicks; and to be necessary for the formation of white blood cells in monkeys.

A second new, almost discovered, vitamin was obtained from cream. Scientists at Oregon State College started with 15 gallons of pale yellow cream and ended up with 1/10,000 of an ounce of a pale yellow oil, yet this oil has almost two-thirds of a certain activity which was in the original 15 gallons of cream.

The Oregon researchers have not named their new vitamin yet. They call it just "A dietary factor essential for guinea pigs." But the 1/10,000 of an ounce they got from 15 gallons of cream is powerful enough to cure the stiff legs of two million guinea pigs. Whether it will have any effect on human stiff legs or any other human ailment has not yet been determined.

Very often vitamins discovered through their effects on animals turn out to be needed by humans, but establishing that fact is often one of the last steps in vitamin research, even though it is one of the biggest reasons for the work.

One of the important lessons for humans learned from vitamin research is the necessity of eating a varied diet with not too many highly refined foods. If you put a rat or guinea pig or chicken on a purified diet, even with doses of all the known vitamins in pure form, the animal generally gets sick. This is because his diet is lacking some important still undiscovered food constituent. Humans who limit their diet to one or two favorite foods, even if they take vitamin pills, are in danger of getting sick because they, too, may be missing some still undiscovered vitamins that are in the foods they don't eat. The more varied the diet, the better the chances for not missing important, undiscovered food elements.

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FOR FIELD TEST—This kit will be used to analyze newly discovered stands of cinchona for concentration of quinine.

PHARMACY

New Portable Unit Tests Cinchona Bark for Quinine

➤ QUININE content of newly discovered cinchona stands can now be analyzed on the spot by a new portable device, instead of sending bark samples to remote laboratories.

The first four units have just been shipped to South America to speed development of quinine sources and for initial tests under field conditions.

Knowing that quinine fluoresces or glows under ultraviolet light, Martin S. Ulan, Rutgers University pharmacy instructor and consultant to the BEW Office of Imports, went to work with associates to develop a machine that would make laboratory testing of cinchona bark unnecessary.

Starting with an instrument used to test fluorescent minerals, the scientists threw away the galvanometer and substituted a set of tubes each containing a different strength of quinine solution; each with a different degree of fluorescence. By comparing these with an unknown sample the quinine content can be calculated.

This test, conducted in a few minutes in the heart of the jungle, is expected to be nearly as accurate as more complicated laboratory procedures. Simple instructions included with the new device can be followed by a layman without technical training.

Science News Letter, April 10, 1943

PHYSICS

Sheets as Well as Blankets Necessary for Soldiers

➤ SHEETS as well as blankets are needed by the Army to keep soldiers sleeping in the open warm and comfortable. The combination of a light blanket and two sheets gives greater body comfort than a single heavy blanket, without necessarily increasing the total weight.

Air permeability is the reason. Wool blankets permit more air to pass through them than do cotton sheets of the ordinary grade. Even one sheet with a blanket is preferable to a heavier blanket alone. These are the conclusions of scientists at the National Bureau of Standards, where tests of the air permeability of sheets, blankets and their combinations have been carried on.

"The thermal transmission in still air," states Herbert F. Schiefer of the Bureau, "decreased considerably when one or two sheets were used in combination with a blanket. The average decrease in thermal transmission for all the blankets tested was 7% when the sheet was used under the blanket, and 15% when the sheet was used over the blanket, and 19% when the blanket was used between two sheets."

The thermal transmission tests were made in still air and in air moving at 15 miles an hour. With blankets alone the heat lost in moving air was 100% greater than in still air. In combination with sheets it was only 37% greater.

A medium-weight blanket and two water-proofed cotton sheets is recommended as standard equipment for lifeboats and liferafts at sea, replacing the present equipment of blankets alone.

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AERONAUTICS

Midwest Plants Ready

Warbirds start to hatch from huge airplane factories in the prairies after year of record-breaking construction. City mushrooms around plants.

See Front Cover

➤ FREEDOM'S EAGLES are beginning to stretch their wings from two great new nests, built on the wind-swept, horizon-filling prairie. One is the plant of the Douglas Aircraft Company, just finished after a year of record-breaking construction by the Austin Company, outstanding architectural and engineering firm. The other is the Army's own Midwest Air Depot, which lies side by side with the Douglas plant, the two together constituting a veritable city of aircraft workers, with a present population of some 22,000—and many more to come.

At the Douglas plant, celebration of the first anniversary of the groundbreaking has just been held. Last March, the Austin Company laid the first foundations of what has since become a tremendous brick structure. In November, the first unit was occupied; now C-47 planes are coming out of the wide delivery doors. The plant will be devoted exclusively to the production of C-47 transport planes — the "Flying Trains" of the Army Air Corps, that carry troops, munitions, weapons, supplies of all sorts. They will fly in huge flocks, from a hundred unnamable Shangri-Las to destinations which the Axis wishes it could guess. And after the war, the same plant will continue to turn out flocks of new transport planes for peacetime commerce.

For the great brooder of tomorrow's wings is designed for permanency. Its walls are massively built, with heat- and cold-resisting properties equivalent to eighty inches of solid brick, although due to a type of construction that must remain a military secret their actual thickness is only a fraction of that figure. The wide-spanned roof, with untrammeled floor space beneath, permits the big C-47's to be wheeled around like a perambulator in a nursery, and will accommodate even larger planes if that becomes desirable.

Lighting is spectacular in its efficiency. Lines of fluorescent tubes run the full length of the main assembly area—probably the longest lines of light anywhere in the world. Other lines come in at right angles, indicating the flow of materials, under them the planes slowly grow, like embryo birds in the shell, until at last they hatch through the wide doors at the end, test their engines with a roar on the outdoor concrete apron, and then wheel out onto the Army airfield's runways to swoop up "into the wide blue yonder."

On the other side of the flying field are the great hangar-type shops of the Midwest Air Depot, where the Army Air Corps' planes, in particular the big bombers, come home from Australia and Africa and India and all the fighting fronts of the world for healing of honorable battle wounds and preparation for further battles to come. Right now Flying Fortresses and Liberators are there, whose weight of wrath the submarine nests at Lorient have felt, and braggart Rommel's battered host, and the Japs at Rabaul and Rangoon. Their war-experienced crews often come with them, and the men and women who do the overhauling learn at first hand how our powerful fighting eagles can be given still more power.

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INVENTION

Steadier Mortar Bomb Is Alien Invention

➤ A STEADIER-FLYING bomb for smoothbore mortars is the invention of a Belgian, Jean Wauters of Brussels, on which patent 2,315,145 has been issued, and promptly taken over for the duration by the Alien Property Custodian.

Distinctive feature about this projectile is a rather heavy, detachable tail containing the propellant charge. This falls off as soon as the bomb is clear of the bore, leaving the missile with its center of gravity farther forward and hence capable of more accurate flight.

Another feature is a groove around the waist of the bomb, in which a loosely-fitting ring is free to roll. This is thrust up by the pressure of the firing charge, making a better seal between projectile and bore and thus increasing muzzle velocity and range.

Science News Letter, April 10, 1943

PUBLIC HEALTH

Fighting War Plague

Medical and health authorities are determined that tuberculosis shall not take its toll in this country. Army is X-rayed. Civilians should be, too.

By JANE STAFFORD

➤ TUBERCULOSIS is on the march again. In Europe, war has already broken the barriers man painfully built through the years against this disease. Reports show an upward swing of cases as the White Plague claims more and more victims. By the time the war is over 10,000,000 persons in Europe will be affected, it is predicted.

Here in America, medical and health authorities are determined to hold this war plague at bay. First and foremost weapon they are using in the fight is the X-ray which shows, before any other sign, when the tuberculosis germ has taken up residence in the lungs and started to brew trouble.

Since the spring of 1942, every man going into service in the armed forces has had his chest X-rayed before induction. Tuberculosis authorities want this example followed by the civilian population, the millions of men too old or too young for service in the armed forces and needed in essential work at home and the 40,000,000 women who are serving their country as workers or homemakers, or both.

The reason for urging X-ray examinations of the chests of every person in the nation is that such examination shows tuberculosis in its earliest stage, when it is most easily cured and before it has had a chance to spread to another person.

Small, Slow Germ

Tuberculosis is caused by a very small, rod-shaped germ. These germs are very fussy about the places in which they live. Their favorite residence site, apparently, is the lungs, though in about five out of 100 times they may take up residence in some other organ of the body. They are also slow-action germs, taking a full day to complete a full cycle of reproduction, for example, whereas pneumonia germs require only 20 minutes for this process. Similarly, the sickness caused by the tuberculosis germs may take years to develop, in contrast with only a few days for the pneumonia germs.

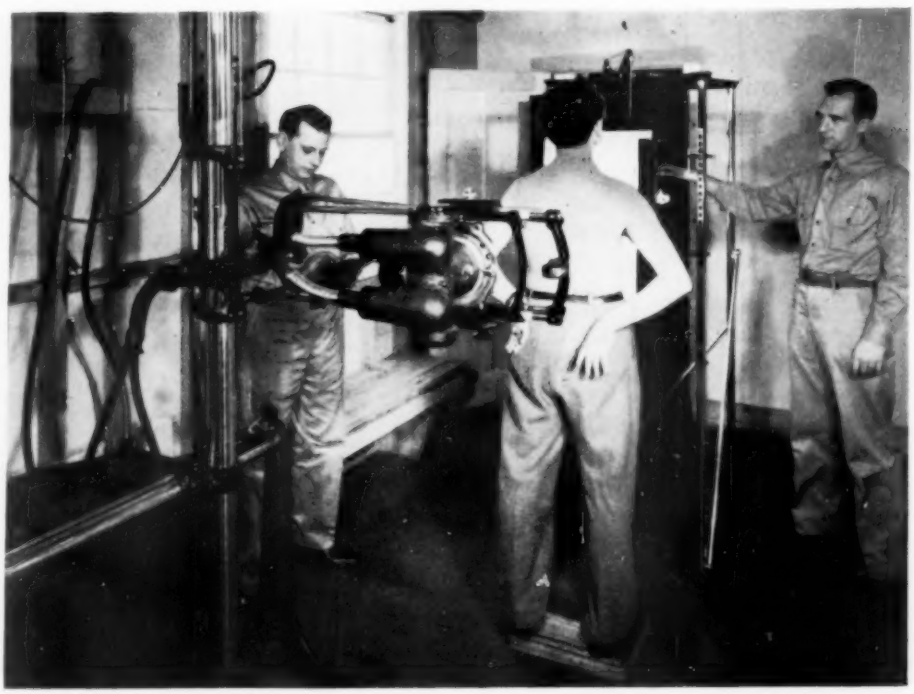
Whether it is the tuberculosis or the pneumonia germ that invades, the body fights back with all its force and may in time be able to kill all the invading germs. Scars of healed tuberculosis, marking the body's victory over the invading germs, can be seen on millions of chest X-ray pictures.

More often, however, instead of victory for the body's germ-resisting forces, there is an armed truce. Both sides fight to standstill, with the body unable to kill all the germs and the germs unable to make headway. This state of balance exists in a person who has what doctors call healed primary tuberculosis. The person is perfectly well but he has tuberculosis germs in his body. Many such people never become sick with tuberculosis.

The state of balance between body resistance and germs, however, can be upset in many ways. One of these is invasion of additional forces of tuberculosis germs. This can happen by coming in contact with a person who is sick with tuberculosis, whether he is in bed or not, and who is scattering germs like parachute troops in droplets of moisture when he coughs.

The balance between tuberculosis germs and the body's resisting forces can also be upset if anything happens to weaken the latter. Serious illness with some other disease often lowers the body's resistance. Lack of proper food, of sufficent rest and sleep, overwork, harmful recreation, worry, excessive stress and strain may lower the body's resistance. Constitutional factors also apparently play a part in maintaining the balance between resistance and the tuberculosis germs. This last factor is being investigated in a research program recently initiated with financial assistance from the National Tuberculosis Association.

You can easily see how war, which overcrowds living quarters, street cars and buses and even work places, increases the chances for tuberculosis germs to get from one person to another. Equally



CHECKING CHESTS—All men going into the armed services are X-rayed for signs of tuberculosis. This is a first step of preparedness against the plague of war.

REDUCED SIZE — Small X-ray films, only four by five inches, are being used in the wholesale job of X-raying the Army. Examples of the small film technique are shown here compared with the usual size at the nurse's right.

obvious are all the war-caused strains, the worry and the difficulty of getting an adequate diet which singly or together may weaken resistance and upset the balance between the tuberculosis germs and the body's fighting forces in favor of the germs.

Even after that balance has been upset, it may be weeks or months before the person is aware that anything is wrong, before he notices that he gets tired easily, especially in the late afternoon, and that he is losing weight, having night sweats and coughing quite a lot. It may be still later before pain in the chest develops or he starts spitting up blood. All that time, however, the germs are making headway, increasing their numbers and destroying lung tissue. The longer the condition goes unnoticed and untreated, the harder and longer and costlier will be the fight to stop the germs and regain the state of balance between them and the body's resistance, and the greater will be the number of other persons exposed to tuberculosis germs that may break the armed truce in their bodies.

The cost of tuberculosis in man-hours lost alone is given in figures from the National Tuberculosis Association:

"Tuberculosis sanatoria are giving more than 22,000,000 patient days of treatment yearly; tuberculosis divisions of hospitals give about 6,000,000. These figures, added to the man-days required to take care of patients by doctors, nurses, cooks and janitors, make a grand total of over 40,000,000 man-days yearly."

This is enough time to build 160 destroyers, or 940 flying fortresses, or 8,000 combat planes, or 16,000 light tanks, or 20,000 howitzers, or 34,000 jeeps, or 550,000 30-caliber machine guns. On the financial side, the cost is equally staggering. The cost of tuberculosis among veterans of the last war alone, before X-rays were used to detect tuberculosis in apparently healthy men and to prevent their being inducted into the Army, has passed the billion dollar mark.

One reason why tuberculosis treatment is so long and costly is that it depends so much on rest. The body must be relieved of all strain and effort so it can concentrate all its strength for fighting the germs back to a standstill. Doctors in recent years have found ways of hastening this process, or helping it along, by putting the affected lung that bears the brunt of the battle at rest. This is usually done by injecting air into the space between the lung and the chest wall, so that the lung, or part of it, collapses. The injected air then acts like a splint, preventing movement of the lung, just as a splint keeps a broken bone from moving while it heals.

Some day there may be a chemical remedy for tuberculosis as effective as sulfa drugs now are in treating pneumonia. Experiments along this line are in progress. The results are promising but the work has not gone far enough for doctors to be ready to use the treatment generally.

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RESOURCES

Search For Crystals

Radio quality quartz needed in large quantities for war purposes. North America believed possible source in addition to South America.

➤ NUMBER ONE strategical mineral problem at present is a domestic source of supply of quartz crystals suitable for radio equipment and other electrical uses in the war effort. Radio is the life line of the armed forces. Battle movements of soldiers, sailors and airforces depend upon it. Dependable instruments in which crystals are used must have crystals of the finest quality.

Brazil and other South American countries are the sources of the present supply. In the United States there are plenty of quartz crystal deposits, but satisfactory crystals for electrical uses had not been developed from them in pre-war days. An intensive search is now being made by the U. S. Geological Survey, the Bureau of Mines and other agencies, to locate quartz crystals with the necessary properties.

Results of the search are promising, although specific information will not be released until after the war. The best prospects appear to be in the crystals found in North Carolina, Virginia, Arkansas and California. The western mountain states are being searched as well.

Not all quartz crystals, regardless of their general resemblance, are usable in electrical work. They must be first cut, and then carefully tested in well-equipped laboratories for their electrical properties. Size and appearance are, however, important factors. To be usable they should be at least an inch in diameter and over two inches long. They should be clear, and free from fractures and discolorations.

Quartz crystals are used in microphones, and as electric filters and oscillators. The so-called piezo-electric quartz crystal vibrates as an electric charge on its surface oscillates. The constancy of the rate of vibration is remarkable. It is more constant than the pendulum on a high-grade astronomical clock. A crystal of good quality kept at a constant temperature will not vary two seconds in ten days. It is this reliability that makes it essential as an electric oscillator.

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A well-mixed *nicotine dust*, 3% nicotine, may be used to control cabbage worms, corn borers and cucumber beetles, replacing war-scarce rotenone and pyrethrum.

ASTRONOMY

Visits of Mexicans to Aid Astronomical Cooperation

➤ ASTRONOMY is helping the good neighbor policy. A group of Mexicans visited Harvard University the week of April 5 to return the visit a year ago of a delegation of American scientists to the opening of the new Mexican National Astrophysical Observatory.

Senor Luis Enrique Erro, director of the new observatory at Tonanzintla, has a Harvard-inspired love of astronomy. It was he who conceived the idea of a new national observatory for Mexico.

Dr. Gonzalo Bautista, governor of the state of Puebla, offered the site at Tonanzintla. Despite war scarcities, a Schmidt telescope for the observatory was made through the cooperation of Harvard Observatory and a Connecticut optical firm.

Governor Bautista, Ambassador Castillo Najera and Director Erro were among those visiting Cambridge. The American Academy of Arts and Sciences held a special meeting in honor of the delegation.

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PUBLIC HEALTH

Urge Steps to Avoid Pearl Harbor of Hospitals

➤ "WE WILL face a Pearl Harbor of hospitals" as war casualties mount unless steps are taken at once to survey existing hospital facilities and to prepare scientifically for their expansion, former Congressman Maury Maverick declared at the meeting of surgeons and hospital administrators held by the American College of Surgeons.

As Director of the Governmental Division of the War Production Board, Mr. Maverick assured his audience that, in spite of shortages of material, "whatever is absolutely indispensable in the proper conduct of hospitals will be made available."

War casualties on a "gigantic scale" must be prepared for, Mr. Maverick stated. No one knows how many these will be, but from current and historical comparisons he gave, the number will be at least between one and two million, maybe many more.

To solve the problem of preparing enough hospital facilities for the war wounded and the civilians, Mr. Maverick proposed that a national committee should be created by joint action of Congress and the President. The committee should include representatives "of the great professional organizations of America, such as the American Hospital Association, the American College of Surgeons and others," he said.

"I do not mean," he added, "that one central command should run all hospitals, far from it."

The committee would be a fact-finding one, to determine present weak spots and inadequacies, to survey the needs not only in relation to war casualties but for the civilian population now and in the future, and to make recommendations for suitable expansion of hospital facilities.

Science News Letter, April 10, 1943

ENGINEERING

Country Lane Is Model for Wartime Emergency Road

➤ NEW wartime roads stem directly from the country lanes and garden paths that everyone has trod. When the emergency demanded vast expansion of the nation's road network for war transport and potential military use, engineers grabbed at the basic idea of compacted soil and gravel which compose ancient byways.

Test data and production methods had to be developed on a large scale basis under conditions that would make the road stand up under the pounding of war traffic.

"The stabilized soil road has not completely emerged from the realm of research," Highway Research Board officials report, "and yet because of its potential advantages it is called upon to play a most important part in the nation's war effort."

Essentially it is just dirt with some gravel, crushed stone, or other granular material thrown in. The granular part furnishes strength and hardness, just as it does in concrete; silt functions as filler to help seat the particles, and the clay cements the whole into a tough mass.

Oldtimers would add a bit of cinders when the lane got muddy or add some dirt to compact a loose gravel spot. But the long ribbons of emergency roads can't be laid by trial and error.

Tests for designing mixtures and controlling construction operations have been worked out by engineers. Although relatively few highway engineers are familiar with the quirks of this new application of the old time road, the tests are simple and elaborate equipment is not needed. Granular material at hand is graded for size and the soil to be used is tested for its binding properties.

Science News Letter, April 10, 1943

IN SCIENC

HORTICULTURE

Heavy Clay Soil Improved By Addition of Coal Ashes

➤ VICTORY GARDENERS who have heavy clay soil to contend with may be able to improve its texture by the addition of sifted anthracite coal ashes and at the same time dispose of the ashes. Coal ash, it is pointed out, improves only the physical state of the soil; it is not a fertilizer. And only anthracite ashes are safe to use.

Clay soils are sticky when wet, and hard when dry. Coal ashes will decrease the stickiness and help prevent the hardness. The amount to use depends upon the soil, but ordinarily two inches of ashes plowed or spaded into six inches of the topsoil is sufficient. The ashes and soil should be well mixed. Vegetables, flowers and grasses will grow better in soil so treated and the labor of taking care of the garden is lessened.

Sandy soils are also improved by anthracite ashes. Their moisture retention properties are increased. In this the ashes have an effect similar to that of humus.

Science News Letter, April 10, 1943

INVENTION

Freeze-Proof Mouthpiece Devised for Parka

➤ FOR USE in extremely cold climates, F. G. Manson and J. J. Maskey of Dayton, Ohio, have invented a non-freezing mouthpiece for a weather-proof parka or head-covering mask, that will give the wearer the appearance of having a short, very stiff beard sticking straight forward.

It will not be a beard, however, but a somewhat loosely packed bundle of stiff bristles or hairs, such as wolverine or horsehair, laid parallel. Ice will not form between these bristles, the inventors claim, no matter how bitter the cold. All that will happen will be the development of a white frost at their outer ends, and this can be knocked off from time to time by a flip of the wearer's glove.

Rights in the patent, no. 2,314,889, are assigned royalty-free to the government.

Science News Letter, April 10, 1943

NCE FIELDS

MEDICINE

Fishing Equipment Needed for Emergency Use by Navy

➤ HOOK, LINE AND SINKER—and all the rest of your fishing equipment are needed to help save the lives of our fighting men. An appeal has gone out from the Medical and Surgical Relief Committee of America.

Mrs. Huttleson Rogers, executive chairman of the committee, urges that all fishermen, sporting goods dealers, and fishing clubs send her organization their spare or discarded fishing tackle. They are needed to help equip special emergency medical kits earmarked for the U. S. Coast Guard and the U. S. Navy.

A simple fishing outfit, for use in time of disaster, is now being included in the portable kit along with essential drugs and emergency surgical instruments. Already the lives of U. S. survivers of torpedoed boats have been saved by catching fish, which are not only valuable for food, but also contain water.

Science News Letter, April 10, 1943

PHARMACY

Push to Find Antimalaria Chemical Going Forward

➤ A GREAT push to find a chemical remedy for malaria "which will not have the deficiencies of quinine, plasmochin and atabrine" is going forward, Col. Paul F. Russell, of the Medical Department of the Army of the United States, reported in the Hermann M. Biggs Memorial Lecture at the New York Academy of Medicine.

"The need is apparent," he said, "when it is recalled that not one of this trio will cure with certainty, not one is a true prophylactic drug, and not one is of much value in the control of community malaria. It seems reasonable to hope that a more effective antimalarial will be developed in the not too distant future."

Notable progress in controlling malaria even in tropical villages has been achieved with pyrethrum spraying, he pointed out. Experiments in rural South India in 1942 proved that the chain of malaria infection can be broken by this method in typical small villages at a per capita cost of about five cents a year, which is economically feasible even in India. The method consists in weekly spraying of huts, cowsheds and outbuildings where the malaria-carrying mosquitoes tend to remain.

Malaria kills at least 3,000,000 persons throughout the world each year and there are at least 300,000,000 cases of malarial fever, Col. Russell stated. In such areas as Burma, New Guinea and the Solomons, malaria is by all odds the greatest disease hazard to our troops and is in some places a greater menace than the enemy.

"It seems incredible that malaria still can be so great a scourge, for it is a preventable disease regarding which we possess as complete knowledge as for any human malady," Col. Russell declared. "There have been devised potent weapons for treatment and control. But malaria persists, of all diseases today probably the most effective barrier to prosperity, contentment, and health. What a paradox! Man, with his incredible machines and his streamlined science, stricken each year in millions because he fails to outwit a mosquito carrying Death in its spittle!"

Science News Letter, April 10, 1943

METALLURGY

Scientists Wrest Secrets From Captured Equipment

➤ WRESTING German secrets from captured war materiel and solving armament problems of the Canadian armed forces are the two main jobs of the Division of Metallic Minerals of the Canadian Department of Mines and Resources.

A Nazi tank track pin and link has just yielded its secret to the metallurgists.

Serving as trouble shooters, they found out why a Canadian armored vehicle part broke under combat conditions. Then they developed better alloys which consume less scarce metals and a new process that is expected to double production of the part.

Canadians were having a tough time hardening a casting used in making an important war weapon. Tests by the Division of Metallic Minerals revealed that some inside areas were especially difficult to cool when the casting was dipped into water to harden it. Working for three days with only six hours sleep, a trouble-shooting scientist devised a spray apparatus which gave war industry a method to cool the casting uniformly.

Science News Letter, April 10, 1943

MEDICINE

Fan, Bulb and Chemical in Kit for War on Influenza

➤ A 50-WATT light bulb, a 10-inch electric fan and about one and one-half pints of propylene glycol in a can or dish with a surface area of 18 square inches are all that are needed for field studies of the possibilities of chemical war against influenza, pneumonia and other diseases that spread through the air. (*Science*, Feb. 26.)

The new simplified field equipment was developed by the personnel of Naval Laboratory Research Unit No. 1 at the University of California. Commander Albert P. Krueger is the officer in charge of the unit.

Propylene glycol vapor has previously been reported by University of Chicago scientists as an effective chemical for disinfecting air containing germs of influenza and other similar diseases. The required concentration of the vapor in a small room of 2,000 cubic feet, with five air turnovers per hour, can be achieved by the apparatus described. The light bulb is placed in the can or beaker of propylene glycol to heat and vaporize the chemical and the fan is placed one or two feet away so that it directs an air stream across the liquid sufrace.

Science News Letter, April 10, 1943

HORTICULTURE

California's Sunshine Too Bright for Tomatoes

➤ CALIFORNIA'S sunshine can be too bright. It has been indicted as the guilty agent in causing the off-coloring defect in market tomatoes known as "gray wall," by two University of California research pathologists, Dr. O. A. Lorenz and Dr. J. E. Knott, of the Experiment station at Davis, Calif. The strong sunlight beating on the exposed sides of the immature fruit, destroys the chlorophyll in the thin-walled outer cells, bringing about the discoloration that impairs marketability.

For this discovery, the two collaborators have been named as winners of the Vaughan Research Award in Horticulture for 1942. The award, which carries with it a stipend of $500, was founded by Leonard H. Vaughan, well-known Chicago seedsman. It is intended primarily as a recognition of published work in the horticultural field that shows promise of practical application on a commercial scale.

Science News Letter, April 10, 1943

MEDICINE

Rationing Is Problem

Hospitals classed with picnic grounds and night clubs in rationing arrangements. This and labor form biggest war time problems.

➤ FOOD RATIONING, for which hospitals have been classed with night clubs and picnic grounds, and labor are about the biggest war time problems hospitals must face, it appears from the report of John H. Hayes, Superintendent of Lenox Hill Hospital and Dispensary, at the symposium on civilian hospitals in war time held by the United Hospital Fund of New York in cooperation with the Greater New York Hospital and the New York Academy of Medicine.

On supplies and rationing, Mr. Hayes said in part:

"No patient, at least in this vicinity, has thus far suffered due to lack of needed drugs or equipment. However, we are handicapped in many ways.

"Every housewife knows how difficult it is today to plan even one meal ahead. Consider the dietitian. She must plan days ahead, and different menus for different types and classes of patients and employees. This has never been easy. Today it is almost impossible; but they do it.

"Rationing is a problem to all Americans. Unfortunately hospitals were not placed in a separate group for special consideration. They were included with night clubs, picnic grounds, etc., and I assure you that no hospital is either, even though we do keep open all night.

"According to the formula, based on meals served in December, our slowest month, many hospitals will be allowed only 20% or 25% of their needs in rationed foods. This would just about take care of their fruit juice requirements.

"I am sure that something will be done to ease this situation."

Hospitals are constantly losing help of all kinds, from cooks to window washers, who are attracted to jobs in war industries and other work by the 40-hour week and high salaries, Mr. Hayes said. Training new employees takes time, and meeting increased labor costs on hospital budgets is difficult. Some hospitals are increasing the rates to patients, but, he added, "if you double the rate to a free patient it is still nothing."

Nurses' aides, girl scouts and various other volunteer groups are helping out on the nurse shortage and doctors themselves are in some places taking over intern duties, even at night, to ease the doctor shortage. On the shortage of other workers, however, Mr. Hayes declared he knew no solution. He paid tribute to the hundreds of workers who still "rightfully feel that they are where they can do the most good, that they are in war work. They are not tempted by shorter hours or temporary high pay. This is patriotism indeed, not at great hazard, as that of others might be, but real patriotism nevertheless. These same people are putting 10% or more of their pay into war bonds and are among the first to add their mite when collections are made.

"Incidentally, these are among the people worth fighting for."

Science News Letter, April 10, 1943

RESOURCES

Sunflower Supplies Oil

➤ SUNFLOWER-SEED oil, which may be obtained in large quantities from certain varieties of the common sunflower, is a possibility in the United States to help fill the shortage in edible oils due to war conditions.

Imported olive oil, which came from Spain, France, Italy and French North Africa, in pre-war days, is now available only in small quantities. Peanut oil and cottonseed oil are demanded in great volume for war purposes. Russian sunflower-seed oil is no longer obtainable. Argentine oils are filling only part of the need. Sunflower-seed oil produced at home would save shipping, supply the demand, and develop a new source of income for the American farmer in post-war times.

American sunflowers grow luxuriantly in much of the country. Much of the seed finds its way into commerce, but largely as bird and poultry feed. Missouri raises the largest commercial crop, even exceeding Kansas where the sunflower is the state flower. California is also raising the seed for market.

Oil from sunflower seed was produced commercially in the United States a generation or so ago on a relatively small scale. The industry was discontinued because of the high labor costs when compared to labor costs in the other countries producing edible oils.

Land suitable for corn is suitable for sunflowers, Dr. G. S. Jamieson of the U. S. Department of Agriculture states. The crop can be planted and cultivated with the same implements. New mechanized methods of harvesting, threshing and processing will make it a profitable crop for oil as well as for poultry feed.

Argentina is showing us the way this can be done. It is now producing large quantities of sunflower-seed oil and shipping much of it to the United States. In 1932 it produced only about 5,000 tons. The Spanish war cut off Argentina's supply of olive oil, and it started to raise its own table oils from peanuts, cottonseed, rapeseed and sunflower seed. Now the amount made from the sunflower far exceeds that from all other sources together. It is nearly 500,000 tons a year, according to the U. S. Department of Commerce, one-fourth of which is being sent to this country.

Science News Letter, April 10, 1943

INVENTION

Growth of Seeds Promoted By Adhesive Envelopes

➤ SEEDS have assumed an importance out of all proportion to their size, as Victory Garden planting is urged even upon city dwellers, and crop prospects are debated daily in Congress. Means for making each seed more efficient, covered by patent 2,313,057, is the invention of Albert C. Fischer of Chicago.

It is a simple method for making each seed carry into the soil a small provision of fertilizer, fungicide, insecticide and (in the case of legumes) nitrogen-fixing bacteria that it needs in its first day or so after germination. This is accomplished by coating the seed with a water-soluble glue into which the initial life-needs of the seedling-to-be are impregnated.

To protect the seed against possible ill effects of too-long contact with fertilizer and fungicidal compounds, it is first covered with a coating of neutral glue, then with one or more coats containing the chemical and bacterial growth aids.

Science News Letter, April 10, 1943

Group of 1943 Science Talent Search Winners leaving the Pan-American Union Building after discussing South American relations with Dr. L. S. Rowe, Director-General.

Prospecting for future scientists

Every step forward in science brings with it a need for more scientists. Not technicians merely, but men and women who are capable of creative achievement.

Where are they to be found?

It seems highly probable that aptitude for creative achievement in science can be discovered as early as the senior year in high school.

It is quite certain that early discovery of ability helps crystallize the interests of the students and stimulates them to further activity.

For these reasons, Science Service, Science Clubs of America and Westinghouse are cooperating in an annual Science Talent Search. Methods employed in the Science Talent Search, including the science aptitude tests, were devised by Dr. Harold A. Edgerton, Ohio State University, and Dr. Steuart Henderson Britt, Office of Psychological Personnel, National Research Council.

Each year, 40 boys and girls selected on the basis of the criteria set up by Dr. Edgerton and Dr. Britt, are taken to Washington as guests of Westinghouse. There, after further examinations and interviews, those who qualify receive Westinghouse Science Scholarships ranging from $100 to $2400.

Last year, 20 Westinghouse Science Scholarships were awarded, but every boy and girl selected for the trip received offers of scholarship help from leading colleges and universities.

Every one entered college.

Every one is making a scholastic record considerably above the average.

Since the Science Talent Search is only in its second year, there are yet no data on the correlation between aptitude as measured by the methods employed and actual achievement in science. Dr. Edgerton and Dr. Britt have, however, begun a projected ten-year study of these boys and girls, covering their work in college and the early part of their after-college careers.

Full information on the Science Talent Search, including reprint of an article by Dr. Edgerton and Dr. Britt describing the methods employed, will be sent on request. Write to Science Service, 1719 N Street, Washington, D. C., or to School Service, Westinghouse Electric & Manufacturing Co., 306 Fourth Ave., Pittsburgh, Pa.

Westinghouse

PLANTS IN 25 CITIES OFFICES EVERYWHERE

MEDICINE

Social Security Urged

Members of the medical profession are told that they have no right to remain individualistic until that system works better than security.

➤ MEMBERS of the medical profession have no right to remain individualistic until individualism can do a better job than social security, Dr. Carl V. Reynolds, State Health Officer of North Carolina and president of the Conference of State and Provincial Health Authorities of North America, told fellow physicians and health officers at the conference meeting in Washington, D. C.

Quoting extensively from the Bible, Dr. Reynolds declared that man must continue striving to regain his biblical heritage of a robust, healthy old age, lost when he listened "to the vain promises of the world's first dictator, the serpent in Eden," and must, if he would survive, follow the admonition to become his brother's keeper.

"Even today," he declared, "we have too many Adam's sons—Cains—in the world of industry, labor and even in our own profession and in our churches that yield not to 'Am I my brother's keeper?' nor 'I am my brother's keeper' and thus failing, forfeit the right to survive."

Charging that "we physicians" are still individualistic, Dr. Reynolds also declared that to regiment medical service would destroy its efficiency. He presented a plan for solving the problem of getting medical care to those needing it as follows:

Organization of a board of directors comprised of the secretary and chairman of the executive committee of the state medical society; representatives from county medical societies; governmental representation; state and county health officers; representatives from Public Welfare, Public Instruction, Parent-Teacher Associations, Hospital Boards, institutions for the blind, mental hygiene and civic clubs and philanthropic citizens.

This board should devise ways and means to "render service to its citizenry in preventive medicine, medical and surgical care, maternal and child hygiene, crippled children and care for the blind and insane. The financing of such an undertaking," he stated, "should come, not through state medicine, contract practice or regimentation, but through supplemental service."

The problem can and should be solved, he said, whereby the indigent can be cared for, the patient retaining the choice of his physician and the physician receiving remuneration on a fee basis for services rendered.

"It is being done at this time in many states in the case of the indigent crippled child, and to the satisfaction of orthopedic surgeons and hospital authorities," he pointed out. "If it can be done for one group, it can be done for all. What we need is action through organized leadership."

Science News Letter, April 10, 1943

ANIMAL BREEDER

Prominent Northern New Jersey pharmaceutical manufacturer offers good opportunity to man (draft exempt) with commercial experience in breeding rats, mice, guinea pigs and other small animals for vitamin assays.

This is a permanent position in an essential industry.

Do not apply if now engaged in war work.

Write fully, education, experience, personal history and salary desired. Box 234, Suite 617, 1457 Broadway, N. Y. C.

MEDICINE

Measures for Controlling Whooping Cough Given

➤ FOR EFFECTIVE control of whooping cough in any community, three measures are recommended in a bulletin from the Illinois State Medical Society. These measures are:

1. Early diagnosis with early quarantine during the early, most contagious period of the disease. This means the period before the whoop starts when the child appears only to have a cold with cough or bronchitis.

2. Strict isolation of all susceptible contacts for two weeks after last exposure. This especially includes exposed children not members of the household, neighbor children, for example, who have not had whooping cough and who played with the whoopers when they were coming down with the disease.

3. Routine prophylactic vaccination of all infants after the seventh month of life.

"Whooping cough is one of the most dreaded maladies of early childhood, not so much the disease itself as what it does," the medical society officials point out. "It is so prostrating, so depleting that, with younger children, complications may prove disastrous. Epidemics have shown a mortality of 20% or higher among children in the first two years.

A cold with running nose, tight, dry cough and perhaps a little fever in a child who has not had whooping cough should warn parents to call the doctor, particularly if the cough persists and grows worse at night. Every child with whooping cough should be under the care of a competent physician, so that all measures possible can be taken to protect him from complications of the disease. An attack of whooping cough breaks down the defense mechanism of the body to such an extent that other diseases may develop. The physician will advise about keeping the child warm, whether or not he should be kept in bed, and how he should be fed to keep up his resistance.

Science News Letter, April 10, 1943

INVENTION

Invention Makes Fuses Safer in Handling

➤ WARLIKE inventions came to the fore again after a lull of considerable length in this particular field.

Prominent among them is a device for rendering sensitive impact fuses for artillery shells safer in handling, but surer in function after being fired. U. S. patent 2,314,891, issued on this device to Col. Wiley T. Moore of the U. S. Army, has been assigned by him to the government for manufacture and use without payment of royalty.

In one general type of impact fuse, it has been customary to "freeze" the firing pin by embedding it in a solid substance that melts or otherwise vanishes when the shell leaves the gun, setting the pin free to function. It would be better, however, if the pin could continue to have at least slight support until it strikes. Col. Moore accomplishes this by using a mixture of a melting and a non-melting substance, like fire-clay and sugar. Then, when the heat of firing melts the sugar, there is a fragile, easily crushed sponge of the refractory material still left around the pin, steadying it until the target is reached.

Science News Letter, April 10, 1943

BOTANY

NATURE RAMBLINGS

by Frank Thone

Meat-Eating Plants

► MEAT-EATING is usually assumed to be a privilege reserved for a relatively limited aristocracy within the animal kingdom—an aristocracy in which man's place at present seems none too secure. Plants are eaten by animals, all the way from almost microscopic insects to elephants; but when a plant eats an animal, that's worth stopping to look at.

One botanist, Dr. Francis E. Lloyd, professor emeritus of McGill University, has been stopping to look at such plants for a good many years now. His studies of the carnivorous plants have taken him all over the world, and at last he has assembled all the facts he has garnered, together with many found out by other botanists, in one book, *The Carnivorous Plants*, which has recently been published by the Chronica Botanica Company.

There are not less than 15 genera of carnivorous flowering plants, besides several of ground-dwelling fungi. The general classes of traps they employ to catch their insect and other small animal prey are listed by Dr. Lloyd as pitfalls, lobsterpots, snares or nooses, sticky flypaper, steel-trap and mousetrap.

None of these is a really simple mechanism. The pitfalls of the pitcher-plants, for example, are not just holes into which insects tumble. They lure their prey with nectar, scent and color-patterns, they make descent into the Avernus easy and escape impossible with alternating zones of slippery surface and downward-pointed bristles. Similarly, the sticky flypaper surface of a butterwort leaf, or on the knobs of a sundew, is rendered more efficient in the one by the incurling edges that go into action when an insect is trapped, and by the closing down of surrounding sticky fingers in the other.

Some of these vegetable traps are marvels of efficiency. The hinged leaf of the Venus flytrap, for example, functions almost exactly after the manner of a steel-trap; it has the two quick-closing halves, triggers to set them off, and interlocking teeth along the edges to render escape more difficult. The underwater box trap of the bladderwort, of which Dr. Lloyd has made a special study, is so complex in both structure and action that a mechanical mousetrap planned to duplicate it as closely as possible looks like one of Rube Goldberg's less conservative creations. Yet it functions unerringly.

Then add to all these complexities the fact that many of these traps are digestive systems as well. Production of protein-dissolving secretions from special glands has been definitely demonstrated in some of them (though not in all) and absorption of the digested remains of the prey seems to be just as well established.

Science News Letter, April 10, 1943

"Put 'em on, Buddy! We need your eyes"

"I'm giving everything I've got, to preserve the kind of a world you want to live in. I'm not kicking either, but I'm expecting you to do your part, too. I depend on your help—in buying War Bonds, in saving your tires, in searching the house for scrap metal. More than that, I'm counting on you for a full week's work—every week."

Industrial eye injuries mean priceless days lost. Foggy vision means costly mistakes and rejections. Whatever your job, your work is no better than your eyes.

For every job, for every requirement you may impose on your eyes, there are goggles and glasses to protect eyes and to bring vision to top performance. Shock-proof lenses. Heavy-duty frames for every industrial use. Lenses to correct almost any visual defect. Graceful rimless eyewear for those who want to look well while they see well.

Bausch & Lomb is manufacturer of goggles, lenses, eyewear and eye examination instruments. Less spectacular, perhaps, these contributions are as important as the special Bausch & Lomb instruments of war—range finders, binoculars, anti-aircraft height finders, aviators' goggles, aerial mapping equipment, and many others going every day to the forces of the United Nations.

Your eyes are important to you—important to the nation. There are men in your community qualified to examine your eyes skillfully, to fit the right glasses. They are ready to put your eyes in fighting trim.

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PSYCHIATRY

Not Due to War Tension

Increasing child delinquency problem is blamed on lack of public funds for services, not on war nerves or war-shattered homes.

➤ JUVENILE delinquency during war time should get priorities in thinking, in activities to meet it and in the public funds, Dr. Max Winsor, of the Bureau of Child Guidance, New York City, declared at the meeting of the American Orthopsychiatric Association in New York.

The major part of the increase in delinquency since the war is not due to war tension and disrupted homes and families. It is due, Dr. Winsor charged, to the way pressure groups and taxpayers' associations have used, or abused, the idea of war economy to cut public funds for services to meet the delinquency problems held over from before Pearl Harbor as well as those arising since then.

Delinquency in New York City had decreased 56% between 1930 and 1940. But by September, 1942, it had increased 23% over the 1941 figure for white children from 7 to 15 years old, Dr. Winsor reported. Especially amazing, he pointed out, was the increase of 33% in delinquency among girls. The rise in delinquency among Negro children was much more moderate, reflecting the increased economic opportunities opening to Negroes during the war. Other communities, it is believed, are facing similar increases in juvenile delinquency since the war.

Delinquency, Dr. Winsor said, is a symptom of social disease. Its threat is especially dangerous in war, but this is true of all delinquency, not just that part occasioned by the war.

Some of the personnel of welfare agencies, probation departments and schools and institutions must be lost to the armed forces. There is, however, no real manpower or womanpower shortage in this field, Dr. Winsor said. The root of the difficulty is the lack of public funds appropriated to employ the necessary personnel.

When fathers go off to war and mothers go into war industry and family incomes are reduced, we should see a strengthening, not a weakening of, school and recreational facilities, welfare and probation departments, to fill the gaps in caring for growing children. The delinquent child who gets only perfunctory, inadequate treatment from juvenile aid and probation services, who is referred to an institution but cannot be admitted because there is no room, not only fails to get adequate treatment but is confirmed in his delinquent ways by learning that nothing will happen if he continues to play truant from school, or to steal or engage in harmful gang activities.

Science News Letter, April 10, 1943

Lesson in Democracy

➤ RATIONING provides "the best opportunity since pioneer days" to show growing children the "importance of individual responsibility without which no democracy can exist," Dr. Helen Ross, of the Institute of Psychoanalysis, Chicago, declared.

Parents and other grown-ups can show children, by the way they meet the discomforts, inconveniences and temptations to evade rationing, the way to become self-reliant, responsible members of the community. Between six and ten years of age, children put a high premium on self-importance. This need for achieving the status of an independent person, Dr. Ross said, can be capitalized on, through the parents' attitude toward rationing, to instil into the child the dignity of man.

Science News Letter, April 10, 1943

● RADIO

Saturday, April 17, 1:30 p.m., EWT

"Adventures in Science" with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. Harlow Shapley, director of Harvard College Observatory, will speak on "Science from Shipboard."

Monday, April 12, 9:15 a.m., EWT; 2:30 p.m., CWT; 9:30 a.m., MWT; and 1:30 p.m., PWT

Science at Work, School of the Air of the Americas over the Columbia Broadcasting System, presented in cooperation with the National Education Association, Science Service and Science Clubs of America.

"Pooling Ideas" will be the subject of the program.

MEDICINE

Surgeons Will Sew Wounds With Nylon Sutures

➤ NYLON SUTURES will be used by surgeons this year to sew war wounds, replacing Jap silk formerly used, E. I. du Pont de Nemours and Company announced.

Millions of feet of the plastic filament formerly produced for tennis racquets and fishing leaders are now being made for surgical sutures and large quantities are being shipped to United Nations' medical depots throughout the world.

Nylon filaments are solid strands, in contrast to braided silk sutures. It is claimed that germs from infected tissue are not absorbed and cannot travel through the nylon as through braid.

The synthetic is also inert, non-irritating and does not fray or splinter, the company reports.

Science News Letter, April 10, 1943

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CHEMISTRY

War Requires Alcohol

New methods for producing and also for using alcohol in the war industries are described before the Farm Chemurgic Conference.

➤ ALCOHOL in enormous quantities is used in the American war industries; directly for war in the production of smokeless powder, mustard gas and Buna S synthetic rubber, indirectly as a solvent in hundreds of industrial processes. Alcohol's war importance was sketched before the Ninth Annual Chemurgic Conference in Chicago; by Dr. Donald K. Keyes of the War Production Board.

Before the war, Dr. Keyes stated, industrial alcohol was produced in the United States almost exclusively from blackstrap molasses, brought in tankers from Cuba and other islands in the Caribbean area. Shortage of tankers has necessitated the use of other materials, notably corn. Distilleries have stopped making whisky to devote their capacity 100% to war-necessary alcohol, and many new plants have been erected. It has been found desirable to substitute wheat for corn to some extent, because of shifts in the relative available amounts of the two grains.

Some promising possibilities, like production of alcohol from wood, and from waste ethylene gas in the petroleum industry, must be postponed, partly because they require quantities of critical materials that cannot be spared from other uses at present, partly because a good deal of research and development work remains to be done. Because of the same lack of critical materials it was found less economical to convert breweries and sugar refineries for alcohol production than to put up entirely new plants with more compact, modern equipment.

Science News Letter, April 10, 1943

Granular Flour Used

➤ ALCOHOL PLANTS that converted from blackstrap molasses to grain have found it advantageous to use what is known as granular flour rather than whole wheat, Philip A. Singleton of the New England Alcohol Company told the Conference. This is wheat stripped of its bran coat and milled into a product resembling a widely known breakfast cereal. This is much more tractable stuff to handle in the fermentation vats. Moreover, the bran can be bagged and sent directly into the stock-feed market, instead of needing to be salvaged and dried as part of the distillery slop.

Science News Letter, April 10, 1943

Speeding Up Production

➤ NEW, VASTLY more efficient methods in producing alcohol from grain were described in some detail by Earl D. Unger of Joseph E. Seagram and Sons, Inc., one of the larger whisky distilling companies, that is now producing headache-juice for the Axis instead of more agreeable fluids for American palates.

The first step in converting crushed grain into alcohol, that of cooking the mash, is now carried out by a flash-conversion process that requires only four or five minutes in relatively compact vessels, instead of the slow hours of simmering in enormous kettles formerly the practice. This saves not only time, but considerable quantities of strategic metals.

The next step, the changing of starch into fermentable sugar by the action of malt enzymes, has also been shortened to a mere 40 seconds, by dint of raising temperatures and pressures. The new, quicker process not only gains hours of time, but increases the yield of alcohol by about a tenth of a gallon per bushel of grain. The amounts of metal needed for apparatus is reduced to a fifth or less of that used in the bulky, old-fashioned distillery vessels. In one part of the distilling equipment it has been found possible to substitute wood for copper.

The most difficult part of the process to speed up is the fermentation itself. Even this, however, shows promise of yielding to the pressure of research now in progress.

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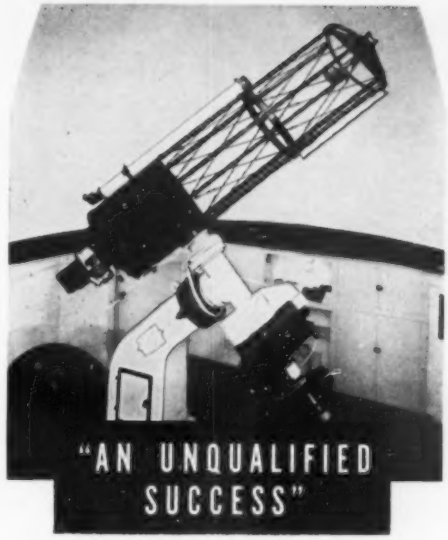
June-harvested *hay* in the northeastern states often has twice as much protein content as hay cut a month later.

Shoe-soles moulded of plasticized polyvinyl chloride are reported to be in general use in Germany as a substitute for scarce leather; they are called "P-soles."



● "The mirrors were entrusted to The Perkin-Elmer Corporation. Our specifications were exacting, as no part of any surface could depart from the theoretical surface by more than one-tenth of a standard wavelength . . . Perkin-Elmer Corporation completed the primary mirror by conventional methods...It was then tested, pronounced well within the specifications, and found to have an unusually fine surface. The two high magnification secondaries, however, presented real difficulties. McCarthy, of Perkin-Elmer, felt that conventional methods of testing were inadequate and proposed a new method, which he has recently described. The Perkin-Elmer Corporation made up the necessary auxiliary optical equipment, and our two secondaries were figured by the new method, which eliminates the combined testing of primary and secondary. These two mirrors have been an unqualified success, both focal lengths being well within specifications, while the figuring is superb. Exposures for the disk of Jupiter are shorter by a factor of at least twelve when compared with our old 10½-inch telescope."

From Volume VIII, No. 6, Publications of The Observatory of The University of Michigan describing the Francis C. McMath Memorial 24-inch Reflecting Telescope, now in operation at the McMath-Hulbert Observatory of the University of Michigan.

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• New Machines and Gadgets •

❁ *AUTOMOBILE TRAILERS used to carry new cars from factories to dealers are now being used for carrying passengers to work in war plants. Bodies fabricated of plywood or patented wallboards, are fitted on the metal frames which formerly carried the cars. They accommodate from 80 to 100 passengers.*

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❁ *HYDRO-SIZING is the new process which makes the body of a chemical mortar shell the correct size on a machine using hydraulic pressure. The old method of sizing the inside of a shell to exact measurements by the use of lathes required skilled operators. The hydro-sizing method is twelve times as rapid and relatively little skill is required to run the press.*

Science News Letter, April 10, 1943

❁ *SHOP MOTOR SWEEPERS that will gather up metal shavings, chips and filings, as well as dust and dirt, are now available. In appearance they resemble gasoline power lawn-mowers and are controlled by handlebars. Accessory parts are available so that the tractors may be used for snow-plows or mowing the lawn.*

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❁ *THE NEW SYNTHETIC rubber shown in the picture has a base of domestic vegetable oils not suitable for use in the kitchen. Commercial production is now under way and requires no critical equipment. It will be used for mats, erasers, treads, gaskets, jar rings and other products, the manufacturer states.*

Science News Letter, April 10, 1943

❁ *THE NEW FISHEYE camera photographs everything in a room above its own level, permitting illuminating engineers to solve illumination problems that would otherwise require elaborate calculations.*

Science News Letter, April 10, 1943

❁ *A SMALL ELECTRIC steam heater for use in small homes, garages and offices, has been recently developed. The electrical energy is applied directly to a vessel of water and the steam created passed through a radiator. It is claimed to be an efficient source of heat.*

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If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, *1719 N St., N. W., Washington, D. C., and ask for Gadget Bulletin 151.*

• Just Off the Press •

AIR NAVIGATION—E. R. Hamilton—*Ronald Press,* 175 p., illus., $2. British origin.

AIRCRAFT RECOGNITION: How to Identify British, Nazi and Italian Planes — R. A. Saville-Sneath — *Penguin Books,* 252 p., illus., 25c. 2d British edition revised and enlarged.

ALPINES IN COLOUR AND CULTIVATION — T. C. Mansfield—*Dutton,* 277 p., illus., col. plates, $3.75.

ATOMS, STARS AND NEBULAE—L. Goldberg —*Blakiston,* 323 p., illus., $2.50. One of the Harvard books on astronomy, edited by Harlow Shapley and Bart J. Bok.

THE BOOK OF KNOWLEDGE: ANNUAL 1943 — E. V. McLoughlin, editor — *Grolier Society*—472 p., illus., red artcraft binding, $10; blue cloth binding, $8.50.

BRUCELLOSIS IN MAN AND ANIMALS — I. Forest Huddleson—*Commonwealth Fund,* 379 p., illus., $3.50. Revised ed.

EVOLUTION: The Modern Sythesis—Julian Huxley—*Harper*—645 p., $5.

FUN WITH SCIENCE—Mae and Ira Freeman —*Random House* — 60 p., illus., $1. Juvenile.

THE GENUS NYSIUS AND ITS ALLIES IN THE HAWAIIAN ISLANDS (Hemiptera, Lygaeidae, Orsillini)—Robert Leslie Usinger—*Bernice P. Bishop Museum,* 167 p., 12 plates, $2. (Bernice P. Bishop Museum Bulletin 173).

GEORGE WASHINGTON CARVER—Hackham Holt—*Doubleday, Doran,* 342 p., $3.50.

INSECTS OF GUAM—*Bernice P. Bishop Museum,* 218 p., illus., $2.50. (Bull. No. 172).

INSTRUCTIONAL TESTS IN ELECTRICITY — Thirteen unit tests covering The Pre-induction Course in Fundamentals of Electricity as recommended by the War Department — Prepared by Benjamin C. Gruenberg and Ellsworth S. Obourn — *World Book Co.,* 32 p., illus., 16c each or $5, package of 50.

INSTRUCTIONAL TESTS IN MACHINES: Fourteen unit tests covering The Pre-induction Course in Fundamentals of Machines as recommended by the War Department — Prepared by Benjamin C. Gruenberg and Ellsworth S. Obourn — *World Book Co.,* 36 p., illus., 16c each or $5, package of 50.

MAN IN STRUCTURE AND FUNCTION—Fritz Kahn—Translated from the German and edited by George Rosen—*Knopf*—2 volumes, 756 p., illus., $10.

PAPERS FROM TORTUGAS LABORATORY: VOLUME XXXIII — Carnegie Institution of Washington—*Carnegie Institution of Washington,* 195 p., illus., 7 plates, $1.50 paper; $2 cloth. (Publication No. 524).

THE PHYSICAL SCIENCES—George S. Eby, Charles L. Waugh, Herbert E. Welch and Burdette H. Buckingham—*Ginn,* 493 p., illus., $2.28. Textbook.

REPORT OF THE COMMITTEE ON MARINE ECOLOGY AS RELATED TO PALEONTOLOGY 1941-1942, Harry S. Ladd, chairman — *National Research Council,* 58 p., 50c. (Presented at the Annual Meeting of the Division of Geology and Geography).

RESINS, RUBBERS, PLASTICS: A Survey and Report—H. Mark and E. S. P. Proskauer, editors — *Interscience,* loose-leaf, $38, binder included.

RIO MAYO PLANTS: A Study of the Flora and Vegetation of the Valley of the Rio Mayo, Sonora—Howard Scott Gentry—*Carnegie Institution of Wash.,* 328 p., 29 plates, $2.25 paper; $2.75 cloth. (Publication 527).

RUSSIA — Bernard Pares — *Penguin Books,* 245 p., 25c.

SPICE & SCENT: Herbs in Fact and Fancy—Lee Maril—*Coward-McCann,* 63 p., illus., $1.75. Juvenile.

SYNOPSIS OF DISEASES OF THE SKIN — Richard L. Sutton and Richard L. Sutton, Jr.—*Mosby,* 481 p., illus., $5.50.

VIRUS DISEASES—Thomas M. Rivers, Wendell M. Stanley, Louis O. Kunkel, Richard E. Shope, Frank L. Horsfall, Jr., and Peyton Rous—*Cornell Univ. Press,* 170 p., illus., $2.

WHAT YOU SHOULD KNOW ABOUT THE SIGNAL CORPS—Harry Meyer Davis and F. G. Fassett, Jr.—*Norton,* 214 p., illus., $2.50.

WHITE HOUSE CONFERENCE ON CHILDREN IN A DEMOCRACY, Washington, D. C., January 18-20, 1940—*Gov't. Print. Off.,* 392 p., 65c. Final report. (U. S. Department of Labor, Children's Bureau Publication, No. 272).

X-RAYS IN RESEARCH AND INDUSTRY—H. Hirst—*Chemical Pub. Co.,* 129 p., illus., $2.50. Describes industrial and research problems, particularly those within the scope of physical metallurgy.